Math 321 – Summer 2019

additional practice for chapter 5, confidence intervals

1. If we flip a fair coin 1000 times, find a 95% prediction interval for the number of heads. If we do not know the coin is fair, but get 61 heads, find a 95% confidence interval for the true probability of heads.

2. Consider that a group of 30 people is randomly chosen from of a certain demographic category. The mean heigth is found to be 5 foot 8 inches and the sample standard deviation is found to be 2 inches. Estimate the true mean height of this demographic category with a 95% CI.

3. An internet server has data requests arrive at a very high rate. The number of data requests in a minute is collected for 60 randomly chosen 1 minute intervals. The mean requests per minute is found to be 982. Construct a 95% CI for true mean number of requests per minute. Model the number of requests in a 1 minute period by a Poisson random variable.

4. Polling data of 3,000 likely voters in Florida found Trump and Biden tied at 47% each with 6% indicating other candidates. Assuming that Biden and Trump are running against each other in 2020, estimate the actual 2020 vote result for Florida with a 95% confidence interval.

5. A consumer preference survey randomly sampled 50 people from county A and 75 people from county B. Thirty one people from county A indicated that they preferred product I over product II, and 52 people from county B indicated a preference for I over II. Estimate the difference in proportions between the preference for product I between the two counties with a 95% CI. Estimate the true proportion in county B who prefer product I with a 95% CI as well.